

Service Manual

Radio

Digital Clock Radio

RC-6090

Color

(H)... Gray Type

Area

Country Code	Area	Color
[Z]	Continental Europe	(H)
[ZE]	United Kingdom.	
[ZG]	F.R Germany.	
[ZI]	Italy.	



■ SPECIFICATIONS

Frequency Range:	FM; 87.5~108MHz AM; 520~1610kHz
Intermediate Frequency:	FM; 10.7MHz AM; 455kHz...[Z, ZG, ZI] 470kHz...[ZE]
Sensitivity:	FM; 3.2μV/50mW output AM; 100μV/m/50mW output
Power Requirement:	AC; 220V, 50Hz (For [ZE], 240V, 50Hz) Battery; 9V, 006P (6F22/6LR61) for Battery Back-up
Power Output:	300mW...RMS (Max.)
Power Consumption:	5W (AC Only)
Speaker:	8cm PM Dynamic Speaker (16Ω)
Dimensions:	244 × 66 × 140 mm
Weight:	795g without battery

Design and specifications are subject to change without notice.

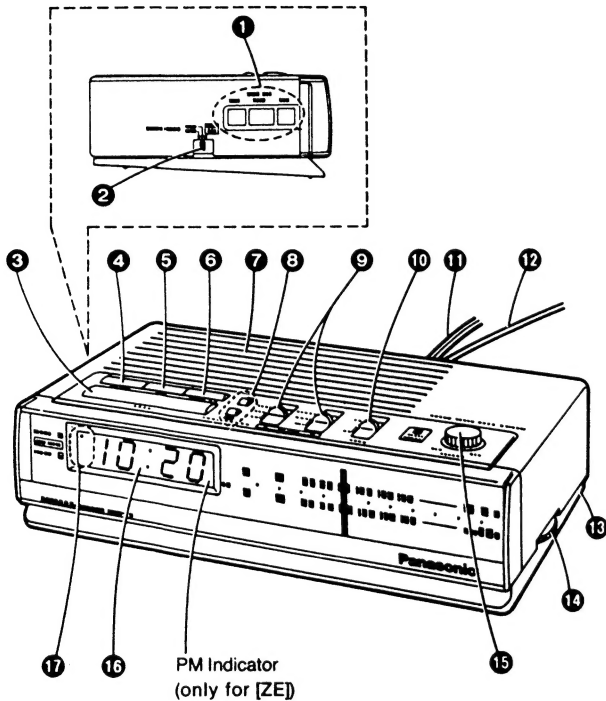
Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

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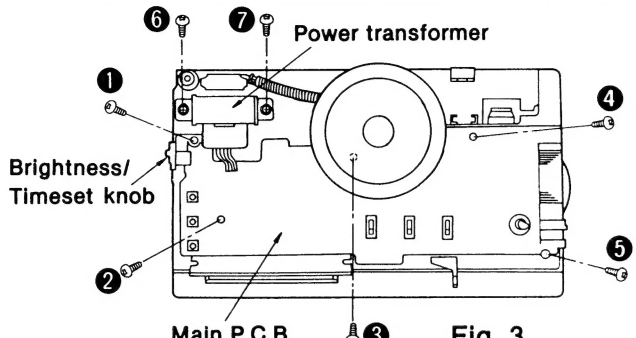
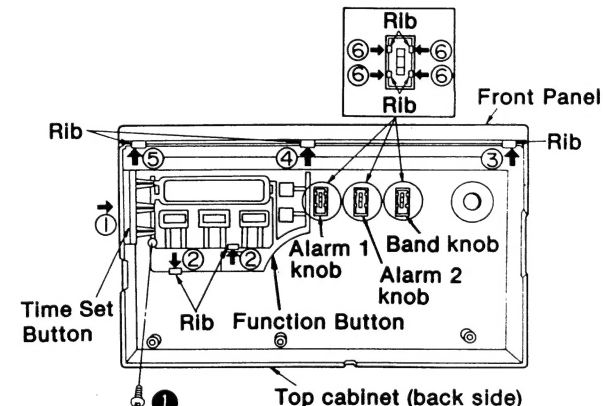
LOCATION OF CONTROLS



- ① Time Set Buttons (TIME SET)
- ② Brightness/Time Set Selector (BRIGHTNESS/TIME SET)
- ③ Doze Button (DOZE)
- ④ Sleep Button (SLEEP)
- ⑤ Off Button (OFF)
This button shuts off radio, alarm, doze and sleep operation.
- ⑥ Radio On Button (RADIO ON)
- ⑦ Speaker: 16Ω, 8 cm
- ⑧ Alarm 1 and 2 Display/Adjust Buttons (ALARM DISP/ADJ)
- ⑨ Alarm 1 and 2 Selectors (1-ALARM-2)
- ⑩ Band Selector (BAND)
- ⑪ AC Power Cord
- ⑫ FM Antenna Cord
- ⑬ Back-up Battery Compartment [bottom]
- ⑭ Tuning Control (TUNING)
- ⑮ Volume Control (VOLUME)
- ⑯ Clock Display
- ⑰ Alarm 1 and 2 Indicators

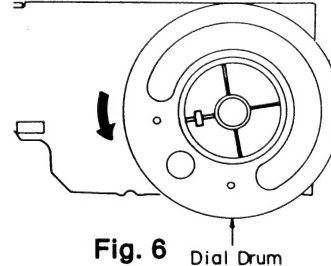
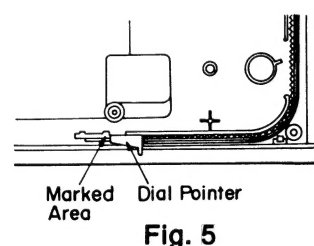
DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the Top cabinet.
Procedure 1	<p>1. Remove the 4 screws (①~④). (Fig. 1)</p> <p>2. Remove the volume knob, and then remove the top cabinet in the direction of arrow ①.</p>
<div><p>Fig. 1</p></div> <div><p>Fig. 2</p></div>	

Ref. No. 2	How to remove the Main P.C.B. and Power transformer.
Procedure 1→2	 <p>1. Remove the 5 screws (①~⑤). 2. Remove the Brightness/Time Set Knob, and then remove the Main P.C.B. 3. Remove the 2 screws (⑥, ⑦), and then remove the power transformer.</p> <p style="text-align: center;">Fig. 3</p>
Ref. No. 3	How to remove the Time set button, Function button, Front panel, Alarm 1 knob, Alarm 2 knob and Band knob.
Procedure 1→3	 <p>1. Remove the time set button in the direction of arrow ①. 2. Remove the one screw (①). 3. Push the rib in the direction of arrow ② and remove the function button. 4. Push the rib in the direction of arrow ③, ④, ⑤ and remove the front panel. 5. Push the rib in the direction of arrow ⑥ and remove the alarm 1 knob, alarm 2 knob and band knob.</p> <p style="text-align: center;">Fig. 4</p>

• DIAL SETTING POINT

1. Match the left side of the Dial Pointer with the marked area. (Fig. 5)
2. Turn the dial drum in the direction of the arrow and install the PCB. (Fig. 6)



MEASUREMENTS AND ADJUSTMENTS

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Set band switch to AM or FM.
3. Set radio on switch to ON.
4. Set power source voltage to AC 220V, 50Hz : [Z, ZG, ZI], AC 240V, 50Hz : [ZE].
5. Output of signal generator should be no higher than necessary to obtain an output reading.

■ AM ALIGNMENT

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONIC VOLT METER or OSCILLOSCOPE)	ADJUSTMENT POINT	REMARKS
CONNECTIONS	FREQUENCY				
Fashion a loop of several turns of wire and radiate signal into loop of receiver.	455kHz: [Z, ZG, ZI] 470kHz: [ZE] 30% Mod. at 400Hz	Point of non-interference. (on/about 600kHz)	AC voltmeter across voice coil.	T3 (AM IFT)	Adjust for maximum output.

■ AM-RF ALIGNMENT

Fashion a loop of several turns of wire and radiate signal into loop of receiver.	511kHz: [Z, ZE] 516kHz: [ZG, ZI] (f min)	Tuning capacitor fully closed.	"	L7 (AM OSC Coil)	Adjust for maximum output.
"	1,650kHz: [Z, ZE] 1,636kHz: [ZG, ZI] (f max)	Tuning capacitor fully open.	"	CT1-4 (AM OSC Trimmer)	"
"	550kHz	Tune to signal	"	(*) L6 (AM ANT Coil)	Adjust for maximum output. Adjust L6 by moving coil along ferrite core.
"	1,500kHz	"	"	CT1-3 (AM ANT Trimmer)	Adjust for maximum output.

(*) Fix antenna coil with wax after completing alignment.

■ FM-IF ALIGNMENT

Connect to test point TP4 through ceramic capacitor (0.001μF). Negative side to test point TP5.	10.7MHz (SWEEP)	Point of non-interference (on/about 90MHz)	Connect vert. amp. scope to test point TP1. Negative side to test point TP2.	T2 (FM 1st IFT)	Wave form is shown in Fig. 2.
"	"	"	"	T4 (FM 2nd IFT)	Wave form is shown in Fig. 1.

■ FM-RF ALIGNMENT

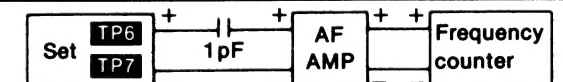
Connect to test point TP3 through FM dummy antenna. Negative side to test point TP5.	86.2MHz [Z, ZE] 87.35MHz [ZG, ZI] (f min)	Variable capacitor fully closed.	"	L5 (FM OSC coil)	(*)2 Adjust for maximum output.
"	109.2MHz [Z, ZE] 108.3MHz [ZG, ZI] (f max)	Variable capacitor fully open.	"	CT1-2 (FM OSC Trimmer)	"
"	106MHz	Tune to signal	"	CT1-1 (FM ANT Trimmer)	"

(*)2 Three output responses will be present; proper tuning is the center frequency.

■ BATTERY BACK-UP CIRCUIT ALIGNMENT (Note: Disconnect AC power cord)

DC POWER SUPPLY		FREQUENCY COUNTER	ADJUSTMENT	REMARKS
CONNECTIONS	VOLTAGE			
(+) Side TP8 (-) Side TP9	9 volts	(+) Side TP6 (-) Side TP7	VR1 (Semi-fixed)	• Adjust VR1 for 2400 ± 15Hz on frequency counter reading. (*3, 4, 5)

- *3. Connect 1pF capacitor to the test point TP6.
- *4. Amplify its out signal by using the AF Amp.
- *5. Measure the frequency.



■ ALIGNMENT POINTS

Please refer to Circuit Board and Wiring Connection Diagram for test point location.

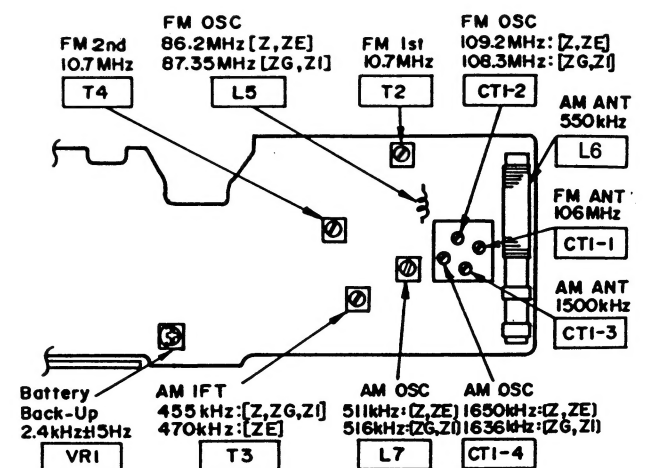


Fig. 3

SCHEMATIC DIAGRAM

Notes:

1. S1-1~S1-2 : Brightness/Time set switch in "TIME SET" position.
(H...HIGH, L...LOW, T...TIME SET)
2. S2-1~S2-2 : Alarm 2 select switch in "OFF" position.
(B...BUZZER, R...RADIO, O...OFF)
3. S3-1~S3-2 : Alarm 1 select switch in "OFF" position.
(B...BUZZER, R...RADIO, O...OFF)
4. S4 : Band switch in "FM" position.
(F...FM, A...AM)
5. S5 : Doze switch. (OFF POSITION)
6. S6 : Sleep switch. (OFF POSITION)
7. S7 : OFF switch. (OFF POSITION)
8. S8 : Radio ON switch. (OFF POSITION)
9. S9 : Alarm 1 disp/adj switch. (OFF POSITION)
10. S10 : Alarm 2 disp/adj switch. (OFF POSITION)
11. S11 : Time set FWD switch. (OFF POSITION)
12. S12 : Time set REV switch. (OFF POSITION)
13. S13 : Time set FAST switch. (OFF POSITION)
14. VR1 : Battery Back-up Control VR.
15. VR2 : Volume Control VR.

16. * L2 are coils formed on the P.C.B. and are thus not found on the replacement parts list.

17. The mark (■) shows test point. e.g. TP1 = test point 1.
DC voltage measurement are taken with electronics voltmeter from negative line.

< > ...FM position. () ...AM position.

➔ + ⊕ Voltage Line
➔ Radio (FM) Signal Line.

18. Important safety notice

Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

A

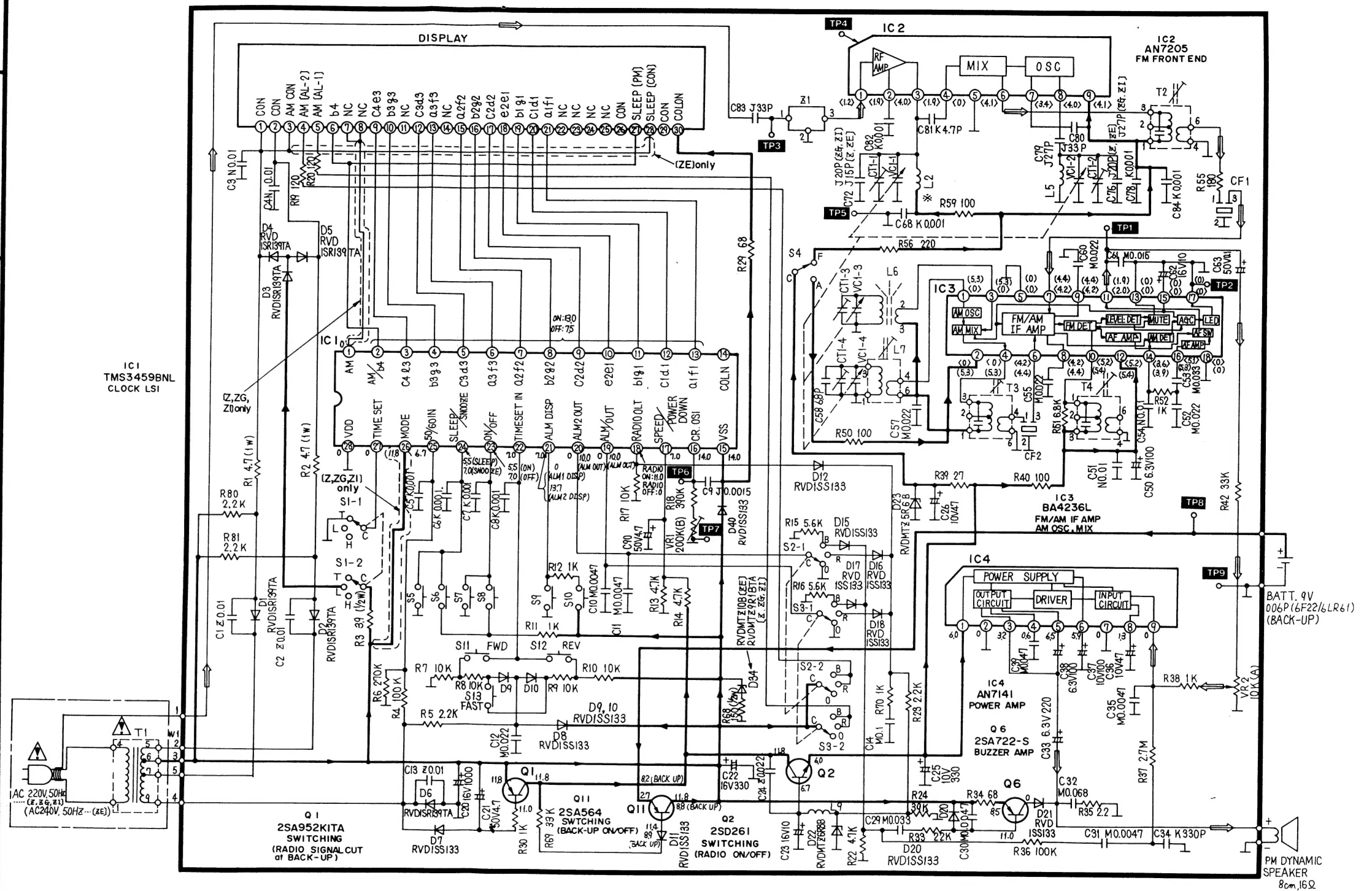
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C

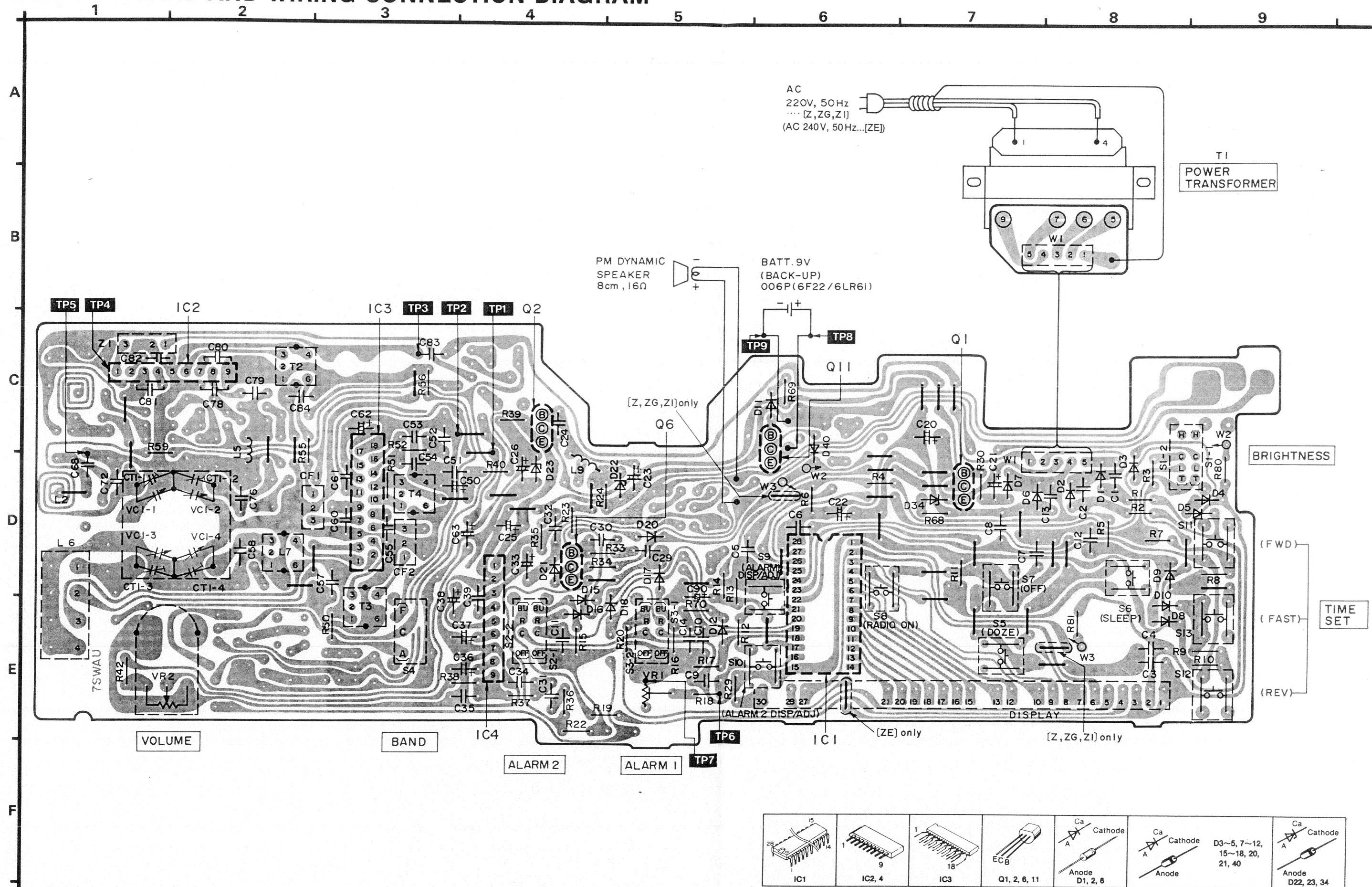
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E

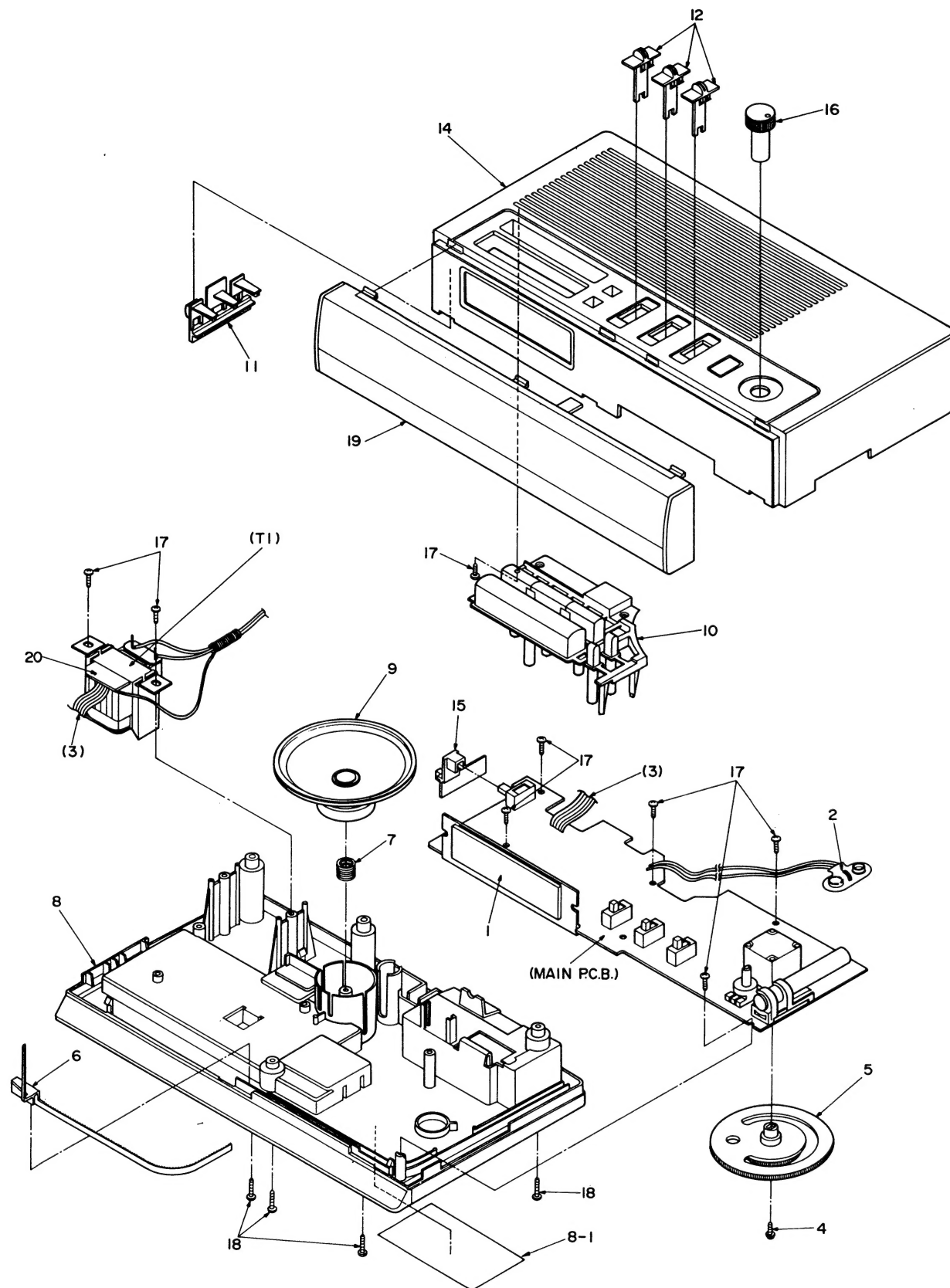
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CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



CABINET PARTS LOCATION



RESISTORS & CAPACITORS

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* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System For Resistors

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1K Ω)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470 Ω)

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001 μ F)	Tolerance	Unique
ECEA	50	M	330	
Type	Voltage (50V)	Characteristics	Value (33 μ F)	

● Capacity values are in microfarads (μ F) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000 Ω , 1M = 1,000k Ω

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W 12 : 1/2W	J : $\pm 5\%$
ERG : Metal Oxide	14 : 1/4W 25 : 1/4W	F : $\pm 1\%$
ERQ : Fuse Type Metal	1A : 1W 18 : 1/8W	G : $\pm 2\%$
ERX : Metal Film	S2 : 1/4W S1 : 1/2W	J : $\pm 5\%$
ERD L : Carbon (chip)	2F : 1/4W 50 : 1/2W	K : $\pm 10\%$
ERO K : Metal Film (chip)	2A : 2W 3A : 3W	M : $\pm 20\%$
ERC : Solid	6G : 1/10W 8G : 1/8W	
ERF : Incombustible Box-Shaped		
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V 1A : 10V	K : $\pm 10\%$
ECCD : Ceramic	1C : 16V 1E : 25V	M : $\pm 20\%$
ECKD : Ceramic Capacitor	1H : 50V 1V : 35V	Z : $\pm 80\%$
ECQM : Polyester	50 : 50V 05 : 50V	-20
ECQP : Polypropylene	2H : 500V 2A : 100V	J : $\pm 5\%$
ECG : Ceramic	1 : 100V 1J : 63V	G : $\pm 2\%$
ECEA N : Non Polar Electrolytic	KC : 400V AC	F : $\pm 1\%$
OCU : Ceramic (Chip Type)	KC : 125V AC (UL)	C : $\pm 0.25pF$
ECUX : Ceramic (Chip Type)		D : $\pm 0.5pF$
ECF : Semiconductor		
EECW : Liquid electrolyte double layer capacitor		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)			CAPACITORS(VALUE,VOLTAGE)					
R1	ERX1ANJ4R7	4.7 1	R50	ERDS2TJ101	100 1/4	C31	RCBS1C472MX	0.0047 16
R2	ERX1ANJ4R7	4.7 1	R51	ERDS2TJ6R2	6.8K 1/4	C32	ECFV1E683MD	0.068 25
R3	ERX12ANJ3R9	3.9 1/2	R52	ERDS2TJ102	1K 1/4	C33	ECEA0JU221	220 6.3
R4	ERDS2TJ104	100K 1/4	R55	ERDS2TJ181	180 1/4	C34	RCBC1H331KB	330P 50
R5	ERDS2TJ222	2.2K 1/4	R56	ERDS2TJ221	220 1/4	C35	RCBS1C472MX	0.0047 16
R6	ERDS2TJ274	270K 1/4	R59	ERDS2TJ101	100 1/4	C36	ECEA1AU470	47 10
R7	ERDS2TJ103	10K 1/4	R68	ERG12ANJ151	150 1/2	C37	ECEA1AU101	100 10
R8	ERDS2TJ103	10K 1/4	R69	ERDS2TJ333	33K 1/4	C38	ECEA0JU101B	100 6.3
R9	ERDS2TJ103	10K 1/4	R70	ERDS2TJ102	1K 1/4	C39	ECFV1E473MD	0.047 25
R10	ERDS2TJ103	10K 1/4	R80	ERDS2TJ222	2.2K 1/4	C50	ECEA0JU101B	100 6.3
R11	ERDS2TJ102	1K 1/4	R81	ERDS2TJ222	2.2K 1/4	C51	RCBS1C103NYY	0.01 16
R12	ERDS2TJ102	1K 1/4				C52	ECFT1C223MD	0.022 16
R13	ERDS2TJ472	4.7K 1/4				C53	ECFT1C333MD	0.033 16
R14	ERDS2TJ472	4.7K 1/4	C1	ECKD1H103ZF	0.01 50	C54	RCBS1C103NYY	0.01 16
R15	ERDS2TJ562	5.6K 1/4	C2	ECKD1H103ZF	0.01 50	C55	ECFT1C223MD	0.022 16
R16	ERDS2TJ562	5.6K 1/4	C3	RCBS1C103NYY	0.01 16	C57	ECFT1C223MD	0.022 16
R17	ERDS2TJ103	10K 1/4	C4	RCBS1C103NYY	0.01 16	C58	RCBS1H688KC	6.8P 50
R18	ERDS2TJ394	390K 1/4	C5	RCBS1H102KB	0.001 50	C60	ECFT1C223MD	0.022 16
R19	ERDS2TJ121	120 1/4	C6	RCBS1H102KB	0.001 50	C61	ECFT1C153MD	0.015 16
R20	ERDS2TJ121	120 1/4	C7	RCBS1H102KB	0.001 50	C62	ECEA1CU100	10 16
R22	ERDS2TJ472	4.7K 1/4	C8	RCBS1H102KB	0.001 50	C63	ECEA1HJ0R1	0.1 50
R23	ERDS2TJ222	2.2K 1/4	C9	ECQP1152JZ	0.0015 100	C68	RCBS1H102KB	0.001 50
R24	ERDS2TJ393	39K 1/4	C10	RCBS1C472MX	0.0047 16	C72	RCBS1H150JC	15P 50
R29	ERDS2TJ680	68 1/4	C11	RCBS1C472MX	0.0047 16	(Z, ZE)		
R30	ERDS2TJ102	1K 1/4	C12	ECFT1C223MD	0.022 16	C72	RCBS1H200JC	20P 50
R33	ERDS2TJ223	22K 1/4	C13	ECKD1H103ZF	0.01 50	(ZG, Z1)		
R34	ERDS2TJ680	68 1/4	C14	ECFV1C104MD	0.1 16	C76	RCBS1H200JC	20P 50
R35	ERDS2TJ2P2	2.2 1/4	C20	ECEA1CU102	1000 16	(Z, ZE)		
R36	ERDS2TJ104	100K 1/4	C21	ECEA1HJ4R7	4.7 50	C76	RCBS1H270JL	27P 50
R37	ERDS2TJ275T	2.7M 1/4	C22	ECEA1CU331B	330 16	(ZG, Z1)		
R38	ERDS2TJ102	1K 1/4	C23	ECEA1CU100	10 16	C78	RCBS1H102KB	0.001 50
R39	ERDS2TJ270T	27 1/4	C24	ECKD1H223ZF	0.022 50	C79	RCBS1H270JL	27P 50
R40	ERDS2TJ101	100 1/4	C25	ECEA1AL331B	330 10	C80	RCBC1H330JL	33P 50
R42	ERDS2TJ333	33K 1/4	C26	ECEA1AU470	47 10	C81	RCBC1H4R7KC	4.7P 50
			C29	ECFT1C333MD	0.033 16	C82	RCBS1H102KB	0.001 50
			C30	RCBS1C472MX	0.0047 16	C83	RCBC1H330JL	33P 50
						C84	RCBS1H102KB	0.001 50
						C90	ECEA1HJ4R7E	4.7 50

REPLACEMENT PARTS LIST

Notes : * Important safety notice :

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Parts without these indications can be used for all areas.

* Δ Indicates parts that are supplied by MESA.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			VARIABLE CAPACITOR		
IC1	TMS3458NL	I.C. CLOCK LSI Δ	VC1	RCV4LC2VK	VARIABLE CAPACITOR
IC2	AN7205	I.C. FM FRONT END	COILS AND TRANSFORMERS		
IC3	BA4236L	I.C. IF AMP	L5	RL04N248-0	COIL, FM OSC
IC4	AN7141	I.C. POWER AMP Δ	(ZG, Z1)		
TRANSISTORS			L5	RL04Y91	COIL, FM OSC Δ
Q1	2SA952K1TA	TRANSISTOR	(Z, ZE)		
Q2	2SD261	TRANSISTOR	L6	RLF2C63	BAR ANTENNA, AM Δ
Q6	2SA722-S	TRANSISTOR	L7	RL02B105	COIL, AM OSC
Q11	2SA564	TRANSISTOR	L9	RLQZL4R7K	CHOKE COIL
DIODES			T1 Δ	RWAC6090ZEKS	POWER TRANSFORMER ASS'Y Δ
D1	RVD1SR139TA	DIODE Δ	(ZE)		
D2	RVD1SR139TA	DIODE Δ	T1 Δ	RWAC6090ZKSN	POWER TRANSFORMER ASS'Y Δ
D3	RVD1SR139TA	DIODE Δ	(Z, ZG, Z1)		
D4	RVD1SR139TA	DIODE Δ	T2	RL14B153	I.F. TRANSFORMER, FM
D5	RVD1SR139TA	DIODE Δ	T3	RL12B458	I.F. TRANSFORMER, AM
D6	RVD1SR139TA	DIODE Δ	T4	RL14B153	I.F. TRANSFORMER, FM
D7	RVD1SS133	DIODE	COMPONENT COMBINATION		
D8	RVD1SS133	DIODE	Z1	EXCFF76108L	COMPONENT COMBINATION
D9	RVD1SS133	DIODE	FILTERS		
D10	RVD1SS133	DIODE	CF1	RVF107WDZ	CERAMIC FILTER, FM
D11	RVD1SS133	DIODE	CF2	RVFSFU455B	CERAMIC FILTER, AM
D12	RVD1SS133	DIODE	(Z, ZG, Z1)		
D15	RVD1SS133	DIODE	CF2	RVFSFU470B	CERAMIC FILTER, AM
D16	RVD1SS133	DIODE	(ZE)		
D17	RVD1SS133	DIODE	SWITCHES		
D18	RVD1SS133	DIODE	S1	RSS3B33Z	SW, BRIGHTNESS
D20	RVD1SS133	DIODE	S2	RSS3B46ZA-H	SW, ALARM Δ
D21	RVD1SS133	DIODE	S3	RSS3B46ZA-H	SW, ALARM Δ
D22	RVDMT26R6B	DIODE	S4	RSS2A67ZA-H	SW, BAND Δ
D23	RVDMT26R6B	DIODE	S5	SSG13	SW, DOZE
D34	RVDMT210B	DIODE	S6	SSG13	SW, SLEEP
(ZE)			S7	SSG13	SW, OFF
D34	RVDMT29R18TA	DIODE	S8	SSG13	SW, ON
(Z, ZG, Z1)			S9	SSG13	SW, ALARM 1
D40	RVD1SS133	DIODE	S10	SSG13	SW, ALARM 2
VARIABLE RESISTORS			S11	SSG13	SW, TIME SET(FWD)
VR1	EVND4AA00825	V.R. BATT. BACK-UP CONT.	S12	SSG13	SW, TIME SET(REV)
VR2	EVJF8AF20A14	V.R. VOLUME	S13	SSG13	SW, TIME SET(FAST)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CABINET AND CHASSIS					
1	SL204227T	DISPLAY, LED CLOCK(12 HOUR) Δ	(ZG)		
(ZE)			8-1	RGT8SXA-0	NAME PLATE Δ
1	SL204230T	DISPLAY, LED CLOCK(24 HOUR) Δ	(ZE)		
(Z, ZG, Z1)			8-1	RGT8SYA-0	NAME PLATE Δ
2	RJB5009XA-1	BATTERY CONNECTOR Δ	(Z)		
3	WBB5CB-6K1K1	FLAT CABLE Δ	9	RAS8P307D	SPEAKER Δ
4	XSN25+8	SCREW Δ	10	RBC14SWA-0	BUTTON, FUNCTION Δ
5	RBT258Z	KNOB, TUNING Δ	11	RBC15SZA-0	BUTTON, TIME-SET Δ
6	RDP2SZC-0	DIAL POINTER Δ	12	RBD4SZA-0	KNOB, BAND/ALARM Δ
7	RUQ50Z	SPRING, SPEAKER Δ	14	RKM4SLB-91	TOP CABINET Δ
8	RYFC6090ZEKS	BOTTOM CABINET ASS'Y Δ	(ZG, Z1)		
(ZE)			14	RKM4SMB-91	TOP CABINET Δ
8	RYFC6090ZGKS	BOTTOM CABINET ASS'Y Δ	(ZE)		
(ZG)			14	RKM4SNB-91	TOP CABINET Δ
8	RYFC6090Z1KS	BOTTOM CABINET ASS'Y Δ	(Z)		
(Z1)			15	RBD5SZA-0	KNOB, BRIGHTNESS Δ
8	RYFC6090ZKSN	BOTTOM CABINET ASS'Y Δ	16	RBN4SZB-0	KNOB, VOLUME Δ
(Z)			17	XTV3+10G	SCREW
8-1	RGT8SYA-0	NAME PLATE Δ	18	XTV3+16G	SCREW
(Z1)			19	RYPC6090MKSN	FRONT PANEL ASS'Y Δ
8-1	RGT8SXA-0	NAME PLATE Δ	20	RUP7SWAU	P.C.B. POWER TRANSFORMER Δ
			(Z, ZG, Z1)		
			20	RUP7SAU-2	P.C.B. POWER TRANSFORMER Δ
			(ZE)		